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EXAMINER	
PARK, JUNG H	

ART UNIT	PAPER NUMBER
2661	

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/918,020	VANGHI, VIERI	
	Examiner	Art Unit	
	Jung Park	2661	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-56 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 2-11,14-16,21-26,31-33 and 55 is/are allowed.

6)☒ Claim(s) 1, 12-13, 17-20, 27-30, 34-54 and 56 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-56 are pending for the examination.

Specification

2. The disclosure is objected to because of the following informalities:

The "demodulator 42" in page 13 of specification should be changed to -- demodulator 34 -- since the element 34 is a demodulator in figure 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -
(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

4. Claims 1, 12, 13, 17-19, 27-30, 34-39, 40-42 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by Chung et al. (U.S. 2002/0151,310, hereafter "Chung").

Regarding claims 1, 27, 35 and 50, Chung discloses the methods of claims 1, 27 & 35 and the base station system of claim 50. Chung discloses, "a method of reverse link flow control for a sector in a high rate packet data network serving a plurality of access terminals (Figure 1, paragraph 0004 *where sector 12, access terminals 16 & 18*), the method comprising:

- determining an individual interference contribution of each access terminal served by the sector based on a reverse data channel rate of the access terminal (col. 4, paragraph 0060 *where the individual interference contribution (SNR) is calculated with the equation*)

- estimating total sector interference for the sector based on the individual interference contributions of the access terminals (col. 3, para. 0049, lines 7-8; col. 4, paragraph 0060 *where the estimated total interference is a summation of the individual interference*); and

- setting a reverse link flow control indicator regulating the reverse data channel rates used by the access terminals based on the total sector interference (Figure 5, element 44; col. 1, para. 0011, lines 6-10; *where access terminal sends a data channel control (DRC) value which is used as a revere link flow control indicator* and col. 2, para. 0016 *where there are four variables for reverse rate control*)."

Regarding claim 12, Chung discloses, "the method of claim 1 wherein determining total sector interference for the sector based on the individual interference contributions of the access terminals comprises summing the individual contributions for all the access terminals served by the sector (col. 3, para. 0049, lines 7-8; col. 4, paragraph 0060 *where the estimated total interference is a summation of the individual interference*)."

Regarding claim 13, Chung discloses, "the method of claim 1 further comprising compensating the estimate of total interference for soft handoff, wherein one or more of the access terminals served by the sector may be in soft handoff with one or more other sectors in the network (col. 1, para. 0014)."

Regarding claims 17 and 18, Chung discloses, "the method of claim 1 wherein setting a reverse flow control indicator regulating the reverse data channel rates used by the access terminals based on the total sector interference comprises setting the reverse flow indicator to indicate a busy condition when the estimate of total interference is above a first threshold, and setting the reverse flow indicator to indicate a not busy condition when the estimate of total interference returns below a second threshold lower than the first threshold (col, 2, paragraphs 0016-0017; col. 4, para. 0069 *where the reverse flow indicator, RAB is set according to a specific threshold* and col. 3, para. 0048 *where channel capacity is nearly proportional to SNR*)."

Regarding claim 19, Chung discloses, "the method of claim 1 further comprising sending the estimate of total interference to a central controller operative to perform inter-sector reverse link flow control based on the estimate of total interference from the sector and one or more other estimates of total interference from one or more other sectors in the network (col. 2, para. 0038 *where there is a controller for controlling reverse data rate based on an estimated amount of interferences in other sectors and it is inherent that there is a base station controller (BSC) as a central controller connected to PDSN and MSC*)."

Regarding claims 27 and 28, Chung disclose, "a method of reverse link flow control in a wireless communication network comprising a plurality of sectors, the method comprising regulating reverse link data rates for access terminals in a first sector in dependence on a sector loading of a second sector to reduce reverse link interference in the second sector caused at least in part by the access terminals controlled by the first sector (col. 4, para. 0060 *where the reverse link data rate of i-th access terminal*

depends on the j-th access terminal because of the factors, $g^2_j P_j(1+\alpha_{Ri})$ *in the equation*)."

Regarding claim 29, Chung discloses, "the method of claim 27 wherein regulating reverse link data rates for access terminals in a first sector in dependence on a sector loading of a second sector to reduce reverse link interference in the second sector caused at least in part by the access terminals controlled by the first sector comprises: estimating total sector interference in the second sector; and causing the first sector to reduce reverse link data rates for at least some of the access terminals controlled by the first sector if the sector interference in the second sector exceeds a defined threshold reducing the total sector interference in the second sector (col, 2, paragraphs 0016-0017; col. 4, para. 0069 *where the reverse flow indicator, RAB is set according to a specific threshold* and col. 3, para. 0048 *where channel capacity is nearly proportional to SNR*)."

Regarding claim 30, it is claim corresponding to claim 1 and is therefore rejected for the similar reasons set forth in the rejection of claim 1.

Regarding claim 34, Chung discloses, "the method of claim 29 wherein causing the first sector to reduce reverse link data rates for at least some of the access terminals controlled by the first sector comprises adjusting a defined threshold for total sector interference used by the first sector to regulate reverse link data rates of the access terminals served by the sector (col. 3, para. 0048 *where the threshold is modified for controlling reverse data rate*)."

Regarding claims 35, 39 and 53, "a method of reverse link flow control in a wireless communication network comprising a plurality of sectors, the method comprising: receiving total sector interference estimates indicative of sector loading from

a plurality of sectors within the network at a central processor; controlling reverse link throughput in at least a first sector in dependence on the interference estimates of at least a second sector to reduce interference in at least the second sector (col. 4, para. 0060 *where the reverse link data rate of i-th access terminal depends on the j-th access terminal because of the factors,* $g^2_j P_j(1+ \alpha_{Ri})$ *in the equation*)."

Regarding claim 36, "the method of claim 35 wherein controlling reverse link throughput in at least a first sector in dependence on the interference estimates of at least a second sector to reduce interference in at least the second sector comprises adjusting one or more flow control parameters used by the first sector in regulating reverse link data rates of access terminals controlled by the first sector (Figure 5, element 44 *where regulating reverse link data rates depending on the DRC value* and col. 2, para. 0016 *where there are four parameters for reverse rate control*)."

Regarding claim 37, it is claim corresponding to claim 17 and is therefore rejected for the similar reasons set forth in the rejection of claim 17.

Regarding claim 38, Chung disclose, "the method of claim 37 wherein adjusting one or more interference thresholds used by the first sector comprises transferring one or more updated interference threshold values to the first sector (col. 4, para. 0069 *where the threshold is modified for controlling reverse data rate needs to be transferred*)."

Regarding claim 40, it is claim corresponding to claim 19 and is therefore rejected for the similar reasons set forth in the rejection of claim 19.

Regarding claim 41, Chung disclose, "the method of claim 40 further comprising inter-dependently controlling reverse link throughputs of the plurality of sectors to increase a total network reverse link throughput (col, 4, para. 0060 *where the total*

network link capacity is increased by controlling an individual controlling reverser link capacity calculated by the equation for i-th MS)."

Regarding claim 42, it is claim corresponding to claims 35, 36 & 38 and is therefore rejected for the similar reasons set forth in the rejection of claim 35, 36 & 38.

Regarding claim 50, Chung discloses, "a radio base station regulating reverse link data rates for a plurality of access terminals, the radio base station comprising:

- a plurality of radio interfaces to support a plurality of connections with the access terminals (Figure 1, elements 14, 16 & 18 *where there are interfaces between a base station and access terminals*);

- a processing system to estimate total sector interference by determining individual interference contributions for the plurality of access terminals using defined channel gain information (Figure 5 *where figure 5 shows the process, therefore there should be a processing system to calculate the total sector interference*);

- a threshold detector to generate a control signal by evaluating the estimated total sector interference with respect to a capacity threshold (col. 4, para. 0069); and

- a reverse activity modulator to set a reverse activity indicator to a busy or not busy state responsive to the control signal (col. 2, para 0017 *where a BS sends the reverse activity indicator to access terminals, therefore, there is a reverse activity modulator in order to set a reverse activity indicator*)."

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to

a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 20 and 43-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Chheda (U.S. 6,188,914).

Regarding claim 20, Chung lacks what Chheda discloses, "sending estimated frequency reuse efficiency to the central controller for use in inter-sector reverse link flow control (Chheda, col. 2, lines 38-42 *where a frequency reuse factor, F is used for reverse link capacity calculation at the controller in base station*)." It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include the frequency reuse factor in Chheda into Chung's method to get the value of the frequency reuse factor. The motivation is to get the ratio of the interference from mobile units within a sector to the total interference from mobiles in other sectors for the purpose of estimating reverse link capacity.

Regarding claim 43, Chung lacks what Chheda discloses, "the method of claim 35 further comprising receiving frequency reuse efficiency estimates from the plurality of sectors (Chheda, col. 2, lines 38-42 *where a frequency reuse factor, F is used for reverse link capacity estimation from the sectors*)."

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include the frequency reuse factor in Chheda into Chung's method to get the value of the frequency reuse factor. The motivation is to get the ratio of the interference from mobile units within a sector to the total interference from mobiles in other sectors for the purpose of estimating reverse link capacity.

Regarding claim 44, although Chung discloses, "the method of claim 43 further comprising controlling reverse link throughput in one or more sectors, including the first

sector, in dependence on the interference estimates (Chung, col. 4, para. 0060 *where the reverse link data rate of i-th access terminal depends on the j-th access terminal because of the factors,* $g^2_j P_j(1+ \alpha_{Ri})$ *in the equation*)", he does not teach what Chheda teaches, "the efficiency estimates from one or more other sectors, including the second sector (Chheda, col. 2, lines 38-42 *where a frequency reuse factor, F is used for reverse link capacity*). Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine the frequency reuse factor in Chheda into the method of estimating reverse link capacity in Chung. The motivation is to include the efficiency factor for the purpose of having an accurate estimation of reverse link throughput.

Regarding claim 45, Chung discloses, "the method of claim 43 further comprising: identifying a sector in the plurality of sectors having a reserve reverse link capacity below a defined threshold, as indicated by the interference estimate for the sector, and having a high frequency reuse efficiency, as indicated by the efficiency estimate for the sector; and causing one or more other sectors in the plurality of sectors that are adjacent to the identified sector to reduce their reverse link throughput, thereby reducing interference in the identified sector (Chung, col. 4, para. 0069-0072)."

Regarding claims 46 and 47, Chung lacks what Chheda discloses, "the method of claim 43 wherein receiving frequency reuse efficiency estimates from the plurality of sectors comprises receiving one of the efficiency estimates from a radio base station in each one of the plurality of sectors at a central processor in a base station controller controlling the radio base stations in the plurality of sectors (Chheda, Figure 1, element 18 *where the base station controller (BSC) is for controlling reverse link throughput as a*

central controller as described in col. 3, lines 10-16)." Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include the BSC in Chheda with Chung's system for the purpose of having a central controller. The motivation is to have a central controller in order to perform inter-sector reverse link flow control.

Regarding claims 48 and 49, they are claims corresponding to claims 35 and 38 and are therefore rejected for the similar reasons set forth in the rejection of claim 35 and 38.

7. Claims 51 and 52 rejected under 35 U.S.C. 103(a) as being unpatentable over Chung in view of Levin et al. (U.S. 2003/0021334, hereinafter "Levin").

Regarding claim 51, Chung lacks what Levin discloses, "the radio base station of claim 50 further comprising a demodulation circuit in each one of the radio interferences to provide pilot channel signal to noise ratio information to the processing system for the connection corresponding to the radio interference, and wherein the processing system uses the pilot channel signal to noise ratio information in determining the individual interference contributions for the connections (Levin, Figure 5, elements 528 & 548; col. 5, para. 0058)." It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to include a demodulation circuit in Levin into Chung's system because one would be motivated to convert the modulated signal into a current equivalent to the original signal.

Regarding claim 52, Chung and Levin are silent on, "the radio base station of claim 50 further comprising a storage element operative to be hold the defined channel gain information, thus permitting the processing system to access the defined channel

gain information for estimating the individual interference contributions. However, it is inherent that there should be a storage element to hold the defined information; otherwise the processing system cannot access the saved information.

8. Claims 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable by Chheda in view of Chung.

Regarding claims 53 and 54, Chheda discloses, "a base station controller for use in a wireless communication network employing reverse link flow control, the base station controller comprising a central processor programmed to:

- receive sector loading estimates from a plurality of radio base stations ; and

- process the sector loading estimates from the plurality of radio base stations (Chheda, Figure 1, elements 18, C1 & C2 *where BSC receives sector (S1-S6) loading estimation including frequency reuse efficiency (for claim 54) from base stations by using equation (2) as described in col. 2, lines 25-42 and process the sector loading estimation with the processor in the BSC*)". However, Chheda lacks what Chung discloses, "to compute a flow control parameter for one or more of the radio base stations;

- wherein the flow control parameter computed for each radio base station is dependent on a sector loading estimate for at least one other radio base station (Chung, col. 2, para. 0016; *where there are four control parameters and* col. 4, para. 0060 *where there is an inter-sector interference which depends on a sector loading estimation for one or more radio stations*)." It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine the flow control parameter in Chung with Chheda because one would be motivated to get an accurate loading estimation for link capacity by considering dependency between radio base stations.

9. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatenable by Chheda in view of Chung and further in view of Bender et al. (U.S. 2003/0076,795 hereinafter "Bender").

Regarding claim 56, Chung is silent on what Chheda and Bender discloses, "the base station controller of claim 53 wherein the central controller (Chheda, Figure 1, element 18) is further programmed to send the flow control parameters to the radio base stations (Bender, col. 2, para. 0027 *where a base station controller (BSC) is to provide a better estimate of the information transmitted by remote station. Therefore, it is inherent that there should be a kind of program to send the flow control parameters to the radio stations in order to function as a central controller.*)."

Allowable Subject Matter

10. Claims 2-11, 14-16, 21-26, 31-33 and 55 are allowed.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jung Park whose telephone number is 571-272-8565 and email address is jung.park@uspto.gov. The examiner can normally be reached on Mon-Fri during 7:10-4:40.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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